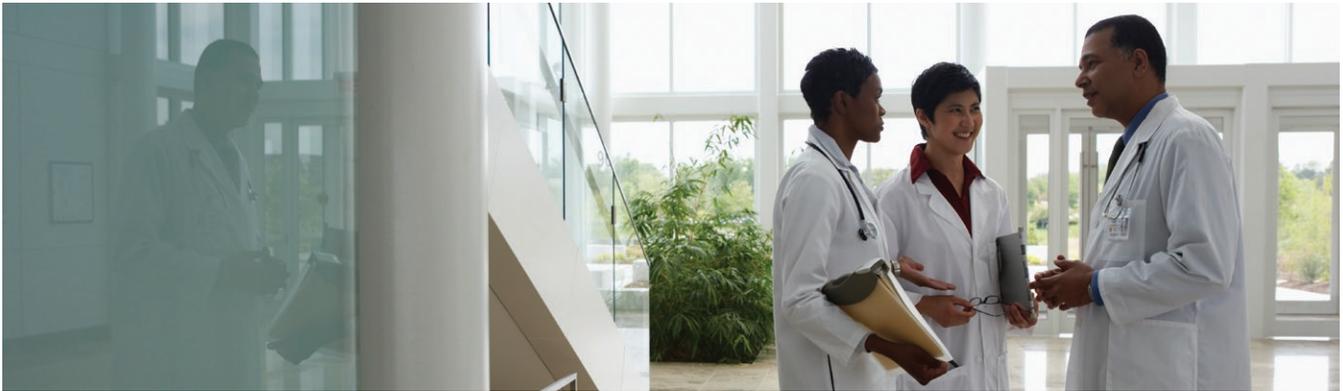




**NetApp™**  
Go further, faster

## Success Story

# Chung Shan Medical University Hospital Strengthens the Management of Medical Records



### KEY HIGHLIGHTS

**Industry**  
Healthcare

#### The challenge

Search for a reliable storage system technology to ensure the backup efficiency and safety of the information in the new-generation hospital information system.

#### The solution

Implement a NetApp® storage solution in conjunction with multiple information backups and virtualization to provide the highest availability in NAS and SAN environments.

#### Benefits

- Increase the overall access rate of the hospital information system (HIS) by three times
- Flexibility to meet dynamically changing space demand
- Enhanced testing accuracy of new applications
- Easy management of centralized storage
- Ability to upgrade and expand equipment without degrading performance

### CUSTOMER PROFILE

Established in 1966, Chung Shan Medical University Hospital (Chung Shan Hospital) is one of the three major medical centers in Taichung City, Taiwan, with an employee force of over 2,000. The hospital consists of five hospital districts: the main hospital, Wen Hsin, Chung Kang, Tai Yuan, and Chung Hsing.

### THE CHALLENGE

#### Cost and performance do not increase in proportion

As the business of the hospital increased along with the volatility of the healthcare environment, the vendor who developed the hospital information system was not able to provide updates in a timely manner. This negatively impacted the operations of the hospital. In view of this, beginning in 2006, the hospital recruited IT personnel and adopted Web 2.0 technology to develop a SmartClient HIS in concert with the hospital's healthcare processes.

The new-generation HIS is greatly improved. The hospital did a comprehensive renovation from core software, servers (from RISC to x86), database (upgraded to Microsoft® SQL Server® 2008), to the storage system.

"In the process of planning the storage for the new-generation hospital information

system, we planned to use the SAN infrastructure as the short-term information storage environment and use the NAS infrastructure for long-term information filing," says Pei-Ran Sun, director of the Information Section of Chung Shan Hospital. "Faced with such demand, the conventional practice would be to purchase two sets of different storage infrastructure solutions. However, the ensuing consequences would include high cost, the complication of management and maintenance, as well as the gap in information accessibility between SAN and NAS."

While Chung Shan Hospital was deep in deliberation, its NetApp system integration partner made a timely proposal of the NetApp unified storage investment concept. At the beginning, Chung Shan Hospital had some doubts on storing all information on a single system. However, on the day of system testing, NetApp was the only company that succeeded in passing the Microsoft SQL Server 2005 backup and restore test. NetApp also let Chung Shan Hospital remove the drive at the scene and the system continued to work without shutting down. This demonstration, which proved how powerful first-hand observation is in the selling process, deeply impressed the information team—and they still are impressed.

# “With the unified storage infrastructure of NetApp, the new-generation hospital information system at our hospital does not need to make investments in two storage systems for SAN and NAS.”

Pei-Ran Sun

Director of the Information Section of Chung Shan Medical University Hospital

“In addition to this, NetApp’s system integration partner also submitted a valuable design plan to address how Chung Shan Hospital’s current PACS and HIS system can perfectly match the unified storage infrastructure,” Pei-Ran Sun emphasizes. “This is very important. When we access new technology, experienced guidance such as this will enable us to get off the ground quickly and accurately judge the effectiveness of our investment.”

## THE SOLUTION

### One machine provides double information protection

Chung Shan Hospital adheres to the concept of “Do more with less” in its development of the hospital information system. This spirit is realized in the conversion project for the new-generation HIS.

In the new system infrastructure, the information in the hospital’s Oracle® 9i™-based PACS and SQL Server-based HIS is connected to a NetApp FAS3020 system through Fibre Channel and is written into both SAN and NAS at the same time. The former is for short-term storage and the latter is for long-term archiving. The hospital has adopted NetApp SyncMirror® software

for duplication, and has determined to transfer the information to a third-line backup two years after its generation.

Chung Shan Hospital was also very impressed by the unique flexibility of the dynamic online deployment of storage hardware resources. The hospital had a Mini PACS (for processing endoscopic films), and the information was stored in a domestically made storage system. There was a breakdown one day, and the manufacturer quoted NT\$20,000 for the repair job and one week to do it, during which time the old information could not be accessed. After the system was returned from repair, it did not work after restarting. This time, Chung Shan Hospital made a complete switch to NetApp FlexVol® software and designated a space to transfer information from the Mini PACS to the FAS3020.

“What we need is this kind of dynamic application flexibility,” says Pei-Ran Sun. “When we have to input a new application program, we do not have to shut down the machine and spend time transferring information. Instead, we can quickly input the information, and the performance of the online system is not disturbed.”

Generally speaking, the infrastructure of the previous information system is to make and use a system for a particular kind of application program software. The development process does not have to consider the integration of other applications, so the building process is easy. In the long run, however, the organization’s information is trapped and isolated. However, NetApp’s storage and information management systems adopt File Form as the management base, so they can comply with regulation requirements and information encryption design. The cost of personnel training can be relatively reduced.

At the present time, Chung Shan Hospital’s database backup operation still uses the backup tool in the existing database, but it has begun to back up image data from the PACS system through NetApp Snapshot™. It also plans to make good use of NetApp FlexClone® software to duplicate the database as the test environment for new applications, simulating real information for testing without disturbing the online operation.

However, the hospital specifies that the gap between the two databases not exceed one day. “The conventional data duplication

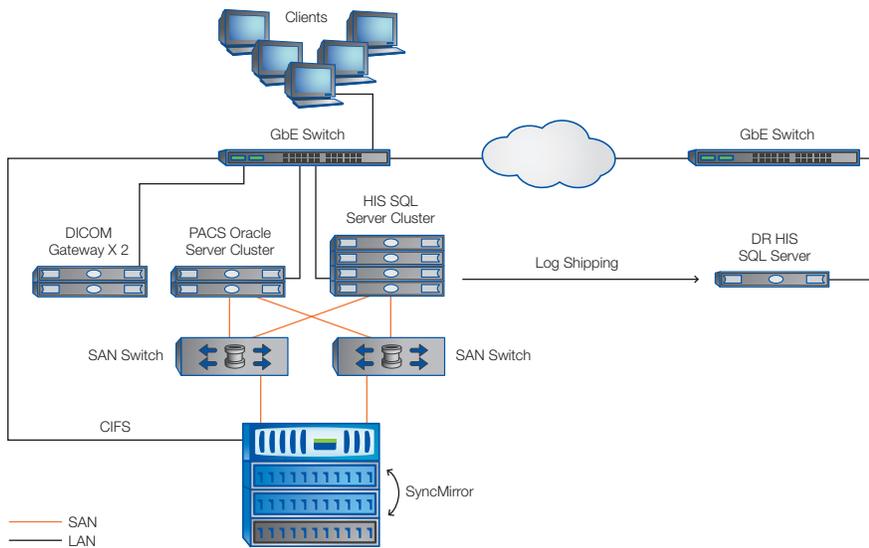


Figure 1) Chung Shan Medical University Information Center system.

method is time consuming, poor in synchronization, and takes excessive storage space,” Pei-Ran Sun says. “However, by adopting NetApp’s patented Snapshot technology in conjunction with its FlexClone tool, we only need the minimum space to have a database that is nearly 100% the same as the online environment. This feature will help to enhance the test accuracy of all new applications.”

## BUSINESS BENEFITS

### The convenience of centralization without any risk

According to Pei-Ran Sun, the largest benefit of the NetApp investment is that “It is able to support SAN and NAS infrastructures at the same time, enables us to save the investment in two systems, and enables centralized storage and management of all information. Using all of the company’s powerful performance software also further ensures that the centrally managed information does not risk having ‘all its eggs in one basket.’”

Looking at the effectiveness of investment in NetApp, in addition to continuing to use the standard Ethernet network to solve the issue of incompatibility, the value of many software functions far exceeds their price. For example, the deduplication technology has reduced the purchasing cost of storage

space and sped up information duplication and restoration without disturbing normal business operation. The RAID-DP® technology has increased the fault-tolerance rate of disks. There is also no longer a need for file system checking and disk scanning, and the management function of the Web interface has reduced personnel training cost enormously.

In fact, with its full file security and high-performance file system, NetApp’s storage system infrastructure is the ideal choice for Chung Shan Hospital’s environment, in which many users need to access data at the same time. A general Windows® or Linux®/UNIX® file system in conjunction with a SAN storage system—even other NAS operating systems modified from Linux, UNIX, or Windows—lacks the integrated design of security, performance, and optimal expansion of the file system. Any infrastructure made by patchwork does not enable the business to use it easily for a long time.

Chung Shan Hospital has affirmed the long-term effectiveness of investment in NetApp solutions. For example, if the storage system’s controller is not sufficient for use, only that part needs to be replaced. The machine and the drive can still continue in use. There is no need to change the machine or to transfer the data. The utility brought

about by those features far exceeds the investment in hardware.

NetApp has provided the hospital with professional and sound technical consultations as well as its overall solutions. The hardware solution was given systems integration certification by the PACS software vendor. Its information storage prevents deletion and alteration, meeting privacy protection regulations against disclosure in its filing performance and remote backup. In addition, the solutions have provided the automatic self-repair of hard disk problems and simultaneous self-verification of combined reading and writing in sections.

After a restart of the file system following a power failure, there is no need to worry about damage to the data. There is also no need to go through the time-consuming file system checking process, and service is available again within minutes.

During its HIS upgrading process, the Chung Shan Hospital IT team not only made improvements in storage technology and system management; the process also deepened the hospital’s understanding of the importance of information security to the business. As a result the team focused its IT infrastructure plan on storage equipment.

# “The adoption of NetApp Snapshot and FlexClone to build database copies provides a nearly synchronous database testing environment for new applications.”

Pei-Ran Sun

Director of the Information Section of Chung Shan Medical University Hospital

“I used to think that the quality of the server is the focus in planning information systems, but I don’t think that way anymore,” Pei-Ran Sun emphasizes. “The host can be replaced if it breaks down, but the damage to the data will shut down the operation of the hospital. After all, the reliability of the storage system is key, because it is data that rules.”

In summary, Director Pei-Ran Sun says, “Finally, we have found out that when the actual quantity of hosts and storage systems is reduced through virtualization, not only is the utility of data raised, but an environmental protection principle is supported: Investing in IT truly achieves energy saving and carbon release reduction.”

## SOLUTION COMPONENTS

### NetApp products

NetApp FAS3020 storage system

RAID-DP

NetApp deduplication

NetApp Snapshot

NetApp SnapRestore®

NetApp FlexClone

NetApp SyncMirror

NetApp SnapManager® for Microsoft SQL Server

### Environment

Applications: Picture Archiving and Communications System, Hospital Information System

Databases: Oracle 9i, Microsoft SQL Server 2008

Users: 2,000 employees

### Protocols

FC SAN, iSCSI, NAS-NFS, NAS-CIFS



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